



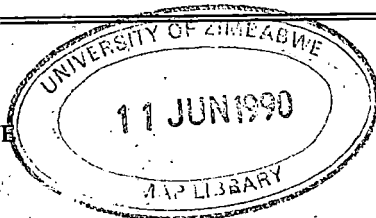
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MEASURES OF INDUSTRIAL DISTRIBUTION IN ZIMBABWE

by

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The dynamic role which industrialization plays in the growth of a national economy has been widely recognized (Hamilton and Linge, 1981; Wood, 1980; Krume, 1969). Growth in the industrial sector triggers growth in both the primary and tertiary sectors through backward and forward linkages. Not only does the manufacturing sector produce machinery, fertilizers and pesticides for agriculture, but its growth promotes expansion of the tertiary sector as well. Given the importance of the manufacturing sector it is essential to study factors influencing the location of various industries in this sector and to examine the spatial distribution of the industry. This paper will concentrate on the somewhat neglected aspect of the spatial distribution and changes in the distribution of manufacturing industry in Zimbabwe.

Industrial geographers have employed several approaches in measuring variations in the spatial distribution of industry. One approach, after Alexander and Lindberg (1961), assumes that most measures of industry such as industrial employment, industrial wages, value added by manufacturing and number of factories, are very highly correlated. Given the high correlation assumption, it makes no difference which measure is employed to examine the distribution and changes in the distribution of industry. This approach has been used extensively in studying the industrialization of countries with poor or inadequate data bases.

Two factors compel the use of the above approach in this study. They are:

- a) the inadequate data on various measures of industry;
- b) the near perfect correlation ($r_s = 0.997$) of the measures used in this study (i.e. number of industrial employees and industrial output).

METHODOLOGY

The data used in this paper were taken from the 1965 and 1978/79 censuses of production published by the Central Statistical Office of Zimbabwe. The two variables used to measure the changing distribution of industry are: industrial output and number of industrial employees (in the formal sector of the economy). Inadequate or inconsistent data precluded the use of variables such as number of factories, industrial area in square metres and total industrial incomes for the labour force. The raw data used to do the calculations appear in Tables 1 and 2.

Table 1: Zimbabwean Manufacturing Industry 1965

Area	Population	Percent of Population	Percent of Net Output	Percent of all Employees
Harare	348 000	44,3	49,0	42,9
Bulawayo	228 000	29,0	28,5	33,4
Kwekwe/Redcliff	33 000	4,2	6,1	4,7
Gweru	42 000	5,3	4,0	4,3
Mutare	44 500	5,7	4,0	4,1
Kadoma	22 000	2,8	2,2	3,1
Masvingo	10 500	1,3	0,7	0,7
Other Areas	58 000	7,4	5,5	6,8
TOTAL	786 000	100,0	100,0	100,0

Sources: The Census of Production (1965), Central Statistical Office,
Zimbabwe.

Table 2: Zimbabwean Manufacturing Industry (1978)

Area	Population	Percent of Population	Percent of Gross Output	Percent of Employees
Harare	564 000	45,4	47,8	45,8
Bulawayo	339 000	27,3	22,4	28,4
Kwekwe/Redcliff	69 000	5,6	10,5	6,0
Gweru	66 000	5,3	4,3	4,7
Mutare	58 000	4,7	2,9	3,4
Kadoma	32 000	2,6	2,7	2,8
Masvingo	21 000	1,7	1,1	0,8
Other Areas	92 000	7,4	8,3	8,1
TOTAL	1 241 000	100,0	100,0	100,0

Sources: The Census of Production 1978/79, Central Statistical Office,
Zimbabwe.

INDUSTRIAL PRODUCTION

According to the data from the industrial censuses published by the Central Statistical Office, industrial production in Zimbabwe increased from less than \$195 million in 1965 to \$512 million in 1978. Tables 1 and 2 show that the increase in industrial production between 1965 and 1978 was accompanied by changes in the distribution of industrial production. Table 1 shows that in 1965 Harare, the country's major industrial centre, had 44.3 percent of the country's urban population and produced 49.0 percent of the net industrial output. By 1978 Harare had 45.4 percent of the country's urban population and it produced 47.8 percent of gross industrial output.

The Lorenz curves in Figure 1 show that between 1965 and 1978 industrial output in Zimbabwe became less spatially concentrated. Over the period, Harare and Bulawayo lost some of their dominance to the smaller centres. However, the two cities still enjoyed a large concentration of manufacturing activities. In 1978 Harare and Bulawayo alone produced 70 percent of the country's industrial output. This concentration level mirrors the experience of other developing countries where the capital city, which is usually a primate city, produces a large proportion of the nation's industrial output (Mabogunje, 1973). Access to a large market, government offices and banking facilities are some of the numerous advantages for entrepreneurs locating in Harare. Harare is not only the country's largest city but it is also the political and economic nerve centre of the nation.

What factors are responsible for the deconcentration of industrial output between 1969 and 1978? It is very unlikely that the process is due to decentralisation efforts by government because by 1978 the government had not developed a strategy for the decentralisation of the manufacturing sector. A possible reason for the slight deconcentration of industry in 1978 might be that in the 1960s, the advantages of locating in the large metropolitan centres were quite marked, partly because of the relative underdevelopment of infrastructure in the rest of the country and partly because none of Zimbabwe's cities was large enough then for any diseconomies constituting a centrifugal force to arise.

By the mid 1970s several urban centres could provide the basic infrastructure to attract industries. However, with the escalation of the liberation war between 1976 and 1979, remote urban centres could hardly attract industries.

INDUSTRIAL EMPLOYMENT

The Lorenz curves (Figure 2) for industrial employment are not as clear as those for industrial output. Between 1965 and 1978 there was a marginal increase in the concentration of industrial employment. Table 1 shows that in 1965 Harare employed 42.9 percent of the country's industrial employees and Table 2 shows that by 1978 it had 45.8 percent of all industrial employees. However the share of Harare and Bulawayo's industrial labour force actually declined from 76.3 percent in 1965 to 74.2 percent in 1978. With the exception of Bulawayo, Mutare and Kadoma, all the other big metropolitan centres in Zimbabwe increased their industrial employment. Kwekwe/Redcliff alone appears to have witnessed a significant increase in industrial employment.

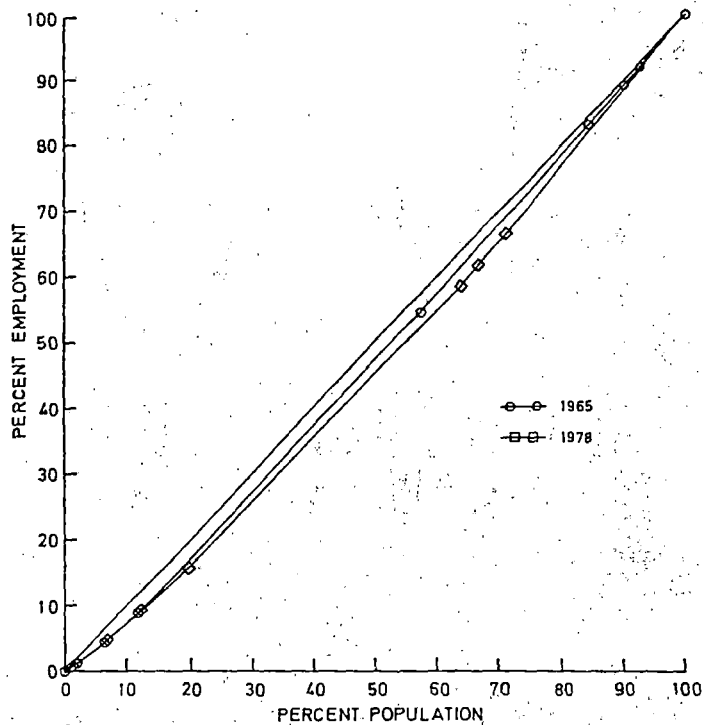


Figure 2: Measures of spatial distribution

Generally the pattern of changing industrial employment is related to that of industrial output. The only exceptions are Bulawayo and Kadoma. Between 1965 and 1978 the contribution of Bulawayo to the national industrial output declined from 49,0 to 47,8 percent. However its share of the industrial employees increased from 42,9 to 45,8 percent during the same period. The situation in Kadoma was different. Its share of the national industrial employees decreased from 3,1 percent to 2,8 percent.

COEFFICIENTS OF LOCALIZATION

Table 3 shows location quotients of the various industrial groups for which complete data is available. Spatially the data are disaggregated into three categories: Harare, Bulawayo and 'other' metropolitan centres. The 'other' municipalities category includes all the other urban centres in the country with manufacturing industries. The summing together of the rest of the centres inevitably produces an obscure picture of the spatial distribution of industry; however, the problem is unavoidable because the Zimbabwean government does not publish comprehensive disaggregated data on industrial production for urban centres other than Harare and Bulawayo.

Table 3: Location Quotients of the Various Industrial Sectors by Urban Areas (average numbers employed)

Industry	Harare	Bulawayo	Other Municipalities
Food Industries	0,98	0,90	1,13
Drink and Tobacco	1,47	0,50	0,70
Cotton Ginning and Textiles	0,52	1,17	1,70
Clothing and Footwear	1,03	1,28	0,63
Wood Products and Furniture	0,94	1,40	0,64
Paper and Printing	1,22	0,50	1,14
Chemical and Petroleum Products	1,50	0,72	0,41

Source: Computed from Census of Production (1978/79)

In Table 3 the location quotients for various industrial sectors are computed using 1978/79 data published by the Central Statistical Office. The formula used for calculating the location quotients was derived from the works of Florence (1948) and Isard (1960).

The location quotients were derived by calculating the ratio between the relative share of industrial employment in a given area and relative

employment in the industry for the whole country.* The number of people employed in a given sector of the industry and area, for example, paper and printing in Harare, is transformed into a percentage. Thus, for food industries it is 15,98 percent for Harare, 14,8 percent for Bulawayo, and 18,43 percent for the other areas. The percentages were then divided by the corresponding national percentage of the food industry which is 16,28 percent.

Where the quotient is less than unity, an area is said to have less than its 'fair share' of the industry. If an area has a location quotient of above unity, then it has more than its 'fair share' of the industry.

The location quotients in Table 3 show that Harare has more than its 'fair share' of the following industries: drink and tobacco; clothing and footwear; paper and printing; and chemical and petroleum products. Harare produced 98,3 percent of the national gross output of tobacco products in 1978 (United Nations, 1981). Harare has a relatively low share of cotton ginning and textiles and wood products and furniture. Bulawayo also enjoys a high concentration of industries. It has more than its 'fair share' of the following industries: cotton ginning and textiles; clothing and footwear; and wood products and furniture. In 1981 Bulawayo produced 71,1 percent of the national wood products and furniture output. Bulawayo has a low share of printing; chemical and petroleum products; and drink and tobacco industries. On the other hand, except for the food industry (which is ubiquitous), the raw materials oriented wood products and furniture industries and the cotton ginning and textiles industry (which is concentrated in the Kadoma-Chegutu region), the other areas have less than their 'fair share' of industries.

The ultimate interpretive utility of location quotients, however, is of limited value for Zimbabwe because of the lack of adequate regional data. The sensitivity of the coefficient is hampered by the summing together of data for several smaller centres.

* For computation of the industrial location quotient, the following formula is used:

$$LQ = \frac{e_{ir}}{T_{jr}} \bigg/ \frac{E_{in}}{T_{jn}}$$

LQ = location quotient of industry i in region j .

e_{ir} = total employment in industry i .

T_{jr} = total employment in all industries in the region.

E_{in} = national employment in industry i .

T_{jn} = total employment in all industries in the region.

EXPLANATIONS FOR THE DISTRIBUTION OF INDUSTRIES IN ZIMBABWE

The various measures of industrial distribution employed in this paper show that manufacturing industry in Zimbabwe is and will remain concentrated in the major urban centres for a long time to come. Efforts made by various governments since 1976 to decentralize manufacturing industries have not been very successful mainly because there has not been a comprehensive location policy for industry; locational policies tend to be made on an ad hoc basis. A policy is required to reduce the effect of the factors which have traditionally influenced the location and distribution of industries in Zimbabwe.

The distribution of manufacturing industries in Zimbabwe is a product of varied and complex factors such as endogenous forces (e.g. market accessibility, location of raw materials, pattern of infrastructural investments), exogenous forces and the role of government. Thus the industrial space which exists today in Zimbabwe is a product of a combination of several forces.

The main reason for the concentration of manufacturing industries appears to be the existence of highly localised markets. Since the early days of the colonial period the distribution of manufacturing was directly related to the market (Kay, 1970). During the early colonial period, commerce and administration were the two major economic activities and these activities were entirely located in urban areas. This resulted in the concentration of people with relatively high incomes who provided a market for imported manufactured goods. The urban centres also developed the best physical and social infrastructure reflecting their economic and political power. In 1985, five years after independence, the distribution of manufacturing industries continues to be concentrated. This in part reflects the past historical forces and the fact that the thresholds for industrial decentralization do not yet exist in other areas, especially in the rural areas. Another reason is that the existing plants continue to satisfy the national market which has grown tremendously since independence, but still remains small.

The occurrence of raw materials is another key factor influencing the distribution of manufacturing in Zimbabwe. The most notable raw material oriented industries in Zimbabwe are the iron and steel works in Kwekwe, the cotton ginning and textile industries in Kadoma and the timber industry in Mutare. A rich commercial farming hinterland producing several cash crops such as tobacco, citrus fruits and maize helps to explain the concentration of drink and tobacco industries in Harare.

The other important factor accounting for the location and distribution of manufacturing industries is the role of agglomeration economies. Agglomeration economies include localization economies, urbanization economies and transfer economies (Moseley, 1974). Firms located in Harare and Bulawayo have benefitted from economies that arose from the clustering of firms belonging either in the same industry or in different industries. The results of a 1983 sample survey carried out by the author showed that Harare firms have benefitted from localization economies which include a pool of skilled labour, specialist subcontract services and the sharing of production techniques (Tevera, 1984). Harare firms also enjoy urbanization economies such as easy access to technical and educational facilities, business services such as advertising agencies and other infrastructure. In addition there are several transfer economies enjoyed by locating in

Harare and Bulawayo. Such economies arise from savings derived from proximity to one another, between buyers and sellers.

Another factor which has influenced the distribution of manufacturing is a factor referred to as initial advantage. Because of initial advantage, Bulawayo succeeded in attracting different foreign firms wishing to locate in Zimbabwe, at least until the early 1960s. Bulawayo was the first urban centre to have a rail link with South Africa and its favourable position with reference to railway lines to nearby countries and the rest of the country promoted the growth of manufacturing activities in the city (Trinder, 1970).

As a result several firms started operations in Bulawayo and these included engineering firms based on the railways and those using coal from nearby Hwange. Other industries which were established in Bulawayo during the early colonial days included the country's first iron and steel works, and a clothing industry which relied on a South African market. A combination of initial advantage, close proximity to thermal power from Hwange, and a direct rail link to the South African markets and to the then Northern Rhodesia and Nyasaland helped to firmly establish Bulawayo as the nation's second largest manufacturing centre.

CONCLUSION

Various contrasting measures of the changing distribution of manufacturing in Zimbabwe show that despite several years of planning to decentralize industries, entrepreneurs are still attracted to the larger urban centres, especially Harare. In the future industrial production will continue to reflect a high degree of spatial concentration. A large proportion of the firms located in the 'big five' industrial centres adequately supplies the national market. This regrettably, is one of the inhibiting factors to industrial decentralization, especially to the growth points.

There is a positive correlation between the distribution of agricultural, forestry and mining resources and the distribution of manufacturing industries. However, manufacturing in Zimbabwe did not spring out of purely 'indigenous' forces based on a simple distribution of power, raw materials and so on. The location of industries is a product of local and external factors.

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